GUIDELINES FOR THE PREVENTION AND CONTROL OF METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* IN LONG TERM CARE FACILITIES

INTRODUCTION

In November of 1995, healthcare professionals in the Sioux Falls community established the Task Force on Antimicrobial Resistance (TFAR). The purpose of the TFAR was to develop an understanding of the potential effects of multiple drug resistant bacteria and to develop strategies for mitigating these effects. The initial focus of the task force was on vancomycin resistant enterococcus (VRE) as a newly emerging pathogen in our area. A Guideline for Prevention and Control of VRE for Long Term Care Facilities (LTCF) was composed and adopted for use statewide by the SD Department of Health. This document has been published in the *South Dakota Journal of Medicine* vol. 51(4)125-132; April, 1998. The TFAR has now tackled composing a guideline for prevention and control of MRSA, a longtime foe.

Methicillin-resistant *Staphylococcus aureus* (MRSA) has become a prevalent nosocomial pathogen in the United States and worldwide. MRSA is now acquired in the community as well as in health care facilities. The most important reservoirs of MRSA are infected or colonized patients or residents. Although health care workers (HCW) can serve as reservoirs for MRSA, they have been more commonly identified as a link for transmission between colonized or infected patients. The main mode of transmission of MRSA is via hands which may become contaminated by contact with a) colonized or infected patients b) colonized personnel, or c) devices, items, or environmental surfaces contaminated with MRSA. Standard Precautions should control the spread of MRSA in most instances.

MRSA has been identified in our state for at least 15 years, initially more commonly recognized in acute care settings than in longterm care facilities. At the present time, however, MRSA is found in both settings. Current published guidelines address infection control and prevention for acute care facilities but are not necessarily applicable to long term residential care settings.

In this document, the Task Force on Antimicrobial Resistance attempts to identify prevention and control strategies for limiting the transmission of MRSA, while recognizing the financial burden and social restriction excessive precautions would place upon residents in long term care settings. The basis of this document relies upon the premise that Standard Precautions, when employed consistently and diligently, will prevent institutional spread, even in situations where MRSA colonization or a carrier state has not been identified. Enhanced microbiologic surveillance for the identification of colonization or carrier states serves no useful purpose. Implementation of excessive precautions, private room requirements, and restriction of colonized persons from social interaction with other residents is generally not indicated. Resources would be better spent educating, monitoring and enforcing good infection control practices. Use of additional precautions is limited to: 1) cases of active infection; 2) situations where body fluids or secretions/excretions known to be culture positive for MRSA cannot readily be contained; and 3) the control of outbreaks. *However, these guidelines must be revised to best meet the unique needs of individual healthcare facilities and their residents.*

EPIDEMIOLOGY

MRSA is a gram-positive bacteria that was first reported in Europe in 1961, soon after methicillin was introduced into clinical practice. MRSA emerged in the U.S. in the early 1960s with the first significant outbreak occurring in 1968. Health care facilities of all sizes now experience MRSA. MRSA has generally been considered a nosocomially-acquired organism, most often associated with transmission within acute care facilities. However, with increasing frequency, MRSA is being recognized as a "community organism", identified upon admission to healthcare facilities, or with cultures obtained on an outpatient basis. Risk factors often include history of significant antibiotic utilization, history of prior hospitalization, and/or residential care living.

MRSA is resistant to methicillin because the organism produces penicillin-binding proteins (PBPs) that interfere with the target site for β-lactam agents. Many MRSA strains are also multidrug-resistant with variable resistance to clindamycin, erythromycin, tetracycline, trimethoprim/sulfamethoxazole, fluoroquinolones, aminoglycosides, and rifampin.

Residents of longterm care facilities may be susceptible to colonization or infection with antibiotic resistant organisms because of medical conditions or history. Although it is important to prevent and control transmission of these organisms we must not forget about dignity and respect for the resident. Common sense and science must merge to create a workable solution in coping with these organisms. The SHEA Position Paper: *Antimicrobial Resistance in Long-Term Care Facilities* strongly emphasizes this goal, stating that, "Residents of LTCFs should not be restricted from participation in social or therapeutic group activities within the facility unless there is reason to think that they are shedding large numbers of bacteria and have been implicated in the development of infection in other residents."[2] These guidelines are intended to blend common sense and science for the optimum treatment of people—residents, visitors and staff.

Risk factors for colonization and infection with MRSA include:

- advanced age
- prior or prolonged hospitalization
- presence and size of wounds (surgical wounds, burn wound, decubitus ulcers)
- stay in an ICU
- presence of invasive indwelling devices (IV catheters, endotracheal tubes, etc.)
- chronic underlying diseases
- direct contact with a colonized or infected resident/patient
- prior and prolonged antibiotic therapy

The most common body sites for colonization are the nasopharynx, wounds, trachea, and perineum. The most common infection site is wounds.

The most frequent route of transmission is resident-to-resident via the hands of transiently colonized HCW.

GOALS OF MRSA PREVENTION AND CONTROL IN LONG TERM CARE FACILITIES

The primary goals of MRSA prevention and control for long term care facilities include:

1. Preventing the transmission of MRSA to other residents, staff, and visitors while preserving the quality of life for those residents colonized with MRSA
2. Facilitating admission or re-admission of residents with MRSA.

The Society of Hospital Epidemiologists of America (SHEA) published a position paper in February of 1996 with several recommendations for dealing with antimicrobial resistance in long term care facilities. One of the control strategies listed states: "Residents who are colonized with antimicrobial-resistant pathogens should not be denied entry into LTCFs." [2] The allowed entry of residents into a LTCF with antimicrobial-resistant pathogens "does not appear to increase facility infection rates or necessarily lead to excess morbidity or mortality." [2]

SURVEILLANCE, PREVENTION AND CONTROL MEASURES

1. Surveillance

Routine surveillance for antimicrobial resistance, including MRSA is an important aspectof the ongoing surveillance program in LTCFs. Surveillance for MRSA should include:

A. Regular review of all microbial data obtained in association with resident care, including microbiologic reports from acute care admissions of LTC residents.

B. Differentiation and documentation of colonization and infection. MRSA colonization is defined as the presence of a positive culture for MRSA, in the absence of clinical signs or symptoms of infection. Sites of colonization frequently include the nares, axilla and groin, as well as sites of wounds or drainage tubes. MRSA infection is defined as the presence of a positive culture for MRSA accompanied by signs or symptoms of infection related to the same body site. Appropriate documentation of the presence of MRSA colonization or infection should be made in the resident's record (e.g. problem list or care plan).

C. Maintenance of a line listing of residents with laboratory identification of MRSA. Those residents whose names are on a line list, should be viewed a potential risk for infection to themselves and others. When transferred to another facility, the receiving institution should be notified of such residents, whether infected or colonized. Line lists should include at a minimum:

- differentiation of colonization and infection
- known sites of colonization or infection
- dates of positive culture(s)

- room location history
- documentation of treatment or decolonization

D. Calculation of MRSA infection rates and institutional prevalence of MRSA

E. Identification of baseline and threshold infection rates that would prompt additional investigation and/or initiation of enhanced control measures. Evaluation of the data for implications of cross-contamination or nosocomial acquisition is essential to monitor the effectiveness of prevention and control activities.

F. Active laboratory surveillance for MRSA should not be routinely conducted.

- Laboratory surveillance for the purpose of identifying colonized residents is not routinely recommended.
- Laboratory surveillance to identify colonized health care providers is not indicated unless there is epidemiologic evidence of an ongoing common source outbreak.
- Environmental sampling for MRSA is of no documented value.

2. Education

All employees of longterm care should receive education and training regarding the importance of MRSA and the real and potential effect it has on colonized or infected residents. Educational opportunities can be provided by members of the TFAR or the SD Department of Health. Please contact any member of the TFAR listed in this document if assistance is desired.

3. Decolonization of MRSA

Standard guidelines for decolonization do not exist in published literature. Measures to eradicate colonization have included topical/systemic treatments and the use of hygienic measures using topical antiseptic agents or special soaps. Eradication of MRSA colonization in residents in the long term care setting is generally not recommended and may in fact contribute to further development of antibiotic resistance. "Even if apparently effective, decolonization often is a temporary phenomenon with recolonization occurring within days or weeks."[2] Certain parts of the population may benefit from decolonization attempts when colonization is shown to predict infection in that population sub-set (i.e. chronic dialysis patients, patients anticipating cardiothoracic surgery, etc.). In addition, decolonization attempts may be used in certain outbreak situations. For further decolonization information consult the medical director or published literature.

4. Treatment of MRSA

The treatment of MRSA will be fundamentally determined by whether an infection or colonization is present. Treatment is reserved for infection (clinical signs and symptoms of infection with positive cultures from significant clinical sites—i.e. blood, wound, urine, sputum, etc.). The drug of choice for treating an MRSA infection is vancomycin. Additional antibiotics may be indicated dependent on susceptibility data and clinical symptoms.

5. Infection Control Practices

Standard Precautions, as defined by the CDC, applies to all residents and includes the following features when handling blood, all body fluids, secretions, excretions, non-intact skin, and mucous membranes. **Standard Precautions are considered adequate for managing residents with MRSA colonization**. Standard Precautions include the following:

A. Handwashing

Wash hands after touching blood, body fluids, secretions, excretions, and contaminated items, whether or not gloves are worn. Wash hands immediately after gloves are removed, between resident contacts, and when otherwise indicated to avoid transfer of microorganisms to other residents or environments. It may be necessary to wash hands between tasks and procedures on the same resident to prevent cross-contamination of different body sites.

Antimicrobial soaps can be used as a control measure but the act of handwashing itself is the most important factor in decontamination of the skin. Incentives for compliance with handwashing recommendations are encouraged rather than relying on antimicrobial soaps as a control measure.

B. Gloving

Wear gloves (clean nonsterile gloves are adequate) when touching blood, body fluids, secretions, excretions, and contaminated items; put on clean gloves just before touching mucous membranes and nonintact skin. Remove gloves promptly after use, before touching noncontaminated items and environmental surfaces, and before going to another resident, and wash hands immediately to avoid transfer of microorganisms to other residents or environments.

C. Facial Protection

Wear a mask and eye protection or a face shield to protect mucous membranes of the eyes, nose, and mouth during procedures and resident-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions.

D. Gowning

Wear a gown (a clean nonsterile gown is adequate) to protect skin and prevent soiling of clothes during procedures and resident-care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions or cause soiling of clothing.

E. Appropriate device handling

Handle used patient-care equipment soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of microorganisms to other residents and environments. Ensure that reusable equipment is not used for the care of another resident until it has been appropriately cleaned and reprocessed and that single-use items are properly discarded.

F. Appropriate handling of laundry

Handle, transport, and process used linen soiled with blood, body fluids, secretions or excretions in a manner that prevents skin and/or mucous membrane exposure, contamination of clothing and transfer of microorganisms to other residents and the environment. Routine handling and laundering of linens is adequate.

G. Contact Precautions and Cohorting

Contact precautions and cohorting of residents should be reserved for active infections (urinary tract infection, pneumonia, etc.), uncontrolled body secretions from a colonized site or draining wounds not contained by a dressing. There may be other epidemiologic significant situations or outbreaks when contact precautions and cohorting may be indicated. *Colonization alone usually does not require contact precautions and use of standard precautions is considered adequate.*

Contact Precautions include:

1. Resident placement

   Place a resident with MRSA in a private room. When a private room is not available, the resident may be placed in a room with a resident(s) who is colonized or has an active infection with MRSA, and no other infection (cohorting). When a private room or cohorting is not possible, roommate selection should take into consideration factors such as: mobility of residents, personal hygiene, containment of infected body fluids, ability to educate residents on handwashing and other prevention measures, placement of invasive devices, presence of open wounds, and need for sharing equipment, supplies furnishings, and restroom facilities, etc.

2. Hand washing and gloving

   Wear gloves (clean nonsterile gloves are adequate) when entering the room. During the course of providing care for a resident, change gloves after having contact with infective material that may contain high concentrations of microorganisms (e.g., fecal material and wound drainage). Remove gloves before leaving the resident's room and wash hands immediately with an antimicrobial agent. After glove removal and handwashing, ensure that hands do not touch potentially contaminated environmental surfaces or items in the resident's room to avoid transfer of microorganisms to other residents and environments.

3. Gowning

   Wear a gown when entering the room if you anticipate that your clothing will have substantial contact with the resident, environmental surfaces, or items in the resident's room, or if the resident is incontinent, or has diarrhea, an ileostomy, a colostomy, or wound drainage not contained by a dressing. Remove the gown and appropriately place with soiled linen, or discard if disposable, before leaving the resident's room. After gown removal, ensure that clothing does not contact potentially contaminated environmental surfaces to avoid transfer of microorganisms to other residents and environments.

4. Resident activities/movement

   During the time of isolation for an active infection limit the movement and transport of the resident from the room for essential purposes only. If the resident is transported out of the room, ensure that precautions are maintained to minimize the risk of transmission of microorganisms to other residents and contamination of environmental surfaces or equipment. This temporary

restriction in activity during an active infection should include group dining for meals, interactive activities and programs.

5. Cleaning

   Ensure that resident-care items, bedside equipment, and frequently touched surfaces receive daily cleaning and as needed when visibly soiled.

6. Resident care equipment

   When possible, dedicate the use of noncritical resident-care equipment and items such as stethoscope, sphygmomanometer, bedside commode, or electronic thermometer to a single resident (or cohort of residents infected or colonized with MRSA) to avoid sharing between residents. If use of common equipment or items is unavoidable, then adequately clean and disinfect them before use on another resident.

6. Cluster/Outbreak of MRSA

If a cluster or outbreak of MRSA infections occurs, an outbreak investigation may be initiated. Outbreak investigations are limited to a higher than expected rate of infection. Outbreak investigations are not indicated for high rates of endemic colonization. The outbreak threshold is based on historical data and a likelihood of nosocomial transmission. Specific outbreak management should use sound epidemiology principles found in many published resources. Enhanced surveillance, control, treatment and decolonization measures may be indicated for outbreak situations.

7. Discontinuing Contact Precautions

Contact precautions can be discontinued when the greatest risk of transmission has passed—the wound no longer is draining or drainage can be easily contained with a small dressing, the resident no longer has diarrhea, the urine is clear, and/or antibiotic treatment has resolved acute symptoms of infection, i.e. the fever has resolved, the wound is not red and swollen, the burning on urination has resolved, etc.

Residents in long term care should return to activities as soon as possible when the acute symptoms of infection are resolved. Reculture of infected/colonized area is not necessary. Negative cultures may give a sense of false security that infection potential has been eliminated. Positive cultures may unnecessarily restrict patient activity or suggest the need for further antibiotic treatment.

CONCLUSION

The primary goals of MRSA prevention and control for LTCFs include:

1. Preventing transmission of MRSA while preserving quality of life for those residents colonized with MRSA

2. Facilitating admission or readmission of residents with MRSA

Coping with multiple drug resistant organisms is an ongoing issue for acute and long termcare facilities alike and is a constant concern for health care providers and residents. It is a compelling task to protect those who are in our care. Armed with knowledge, courage, and commitment the task is manageable.

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